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Is procedural knowledge of recycling correlated with socioeconomic status and residential area?

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ABSTRACT

Aim of the present research is to reveal correlation between procedural knowledge of recycling and socioeconomic status of the primary school children. The present research was designed in correlational research, one of the quantitative research tradition. Data were analyzed through Spearman-Brown Rank Order and multiple regression. Results of the data analysis indicated that procedural knowledge of recycling is positively correlated with maternal education, maternal employment, and residential area rather than paternal education and paternal employment. Regression model strongly fitted into observed data. Regression model also revealed that maternal education, maternal employment and residential area can predict procedural knowledge of recycling among primary school children. Results of the study were discussed along with social learning theory, social capital and relevant literature.

Introduction

Mankind has been exploiting nature over its capacity as a result of urbanization, population increase, manufacturing, carbon emission. Due to those burden on nature, humans have had to transform their present way of living into more sustainable form. Ecological behavior provides a framework about how humans should behave in order to reduce negative impact on nature. Ecological behavior involves energy saving, water conservation, political activism, consumerism, participation to activities organized by environmental organizations. Recycling is also another component of ecological behavior (Duerden & Witt, 2010; Kaiser & Fuhrer, 2003).

Rapid urbanization and population increase, have led to significant rise in waste generation and material consumption. Rapid urbanization and population increase in turn have turned waste generation and material consumption into global problem. Therefore, recycling has become crucial so

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as to decrease human burden on nature. Recycling is described as process in which previously used materials are collected, reprocessed, remanufactured and reused (Cichonski & Hill, 1993; UNEP, 2015).

Recycling is viewed as a behavior which includes technological, contextual, and psychological factors (Bamberg & Moser,2007; Domina & Koch, 2002; Guerin, Crete, & Mercier, 2001; Milfont, Duckitt, & Cameron, 2006; Oskamp, Burkhardt, Schultz, Hurin, & Zelezny, 1998). Besides, knowledge has remarkable influence on recycling behavior because of the fact that knowing how to act on provides basis for initiation of certain behavior. However, knowledge is not solely influential in explaining recycling behavior (Kaiser & Fuhrer, 2003). Knowledge can be considered as a distal factor in explaining a specific behavior.

Knowledge related to recycling behavior involves three forms as declarative knowledge, procedural knowledge, and effectiveness knowledge (Kaiser & Fuhrer, 2003). Declarative knowledge refers to possession of insights on how the environmental system operates (Kaiser & Fuhrer, 2003). Declarative knowledge removes difficulties which hinder people to ecologically act (Lantermann, Döring-Seipel, & Schima, 1992). Procedural knowledge emphasizes knowledge on how to achieve a specific conservational aim. For instance, knowing that a battery should be put into recycle bin rather than thrash bin is a procedural knowledge. (Kaiser & Fuhrer, 2003). Effectiveness knowledge can be considered as an awareness about differential behaviors make different contributions to conservation of the environment (Kaiser & Fuhrer, 2003). In other words, effectiveness knowledge is judgment on different ways of behaviors in terms of cost-effective. Recycling requires different skills and knowledge. First children must know and identify which material can be recycled, then they must find the correct thrash bin, and finally they must throw waste into the recycling thrash bin. As a result, it can be concluded that recycling is a combination of knowledge and behavior (Passafaro & Livi, 2017).

Recycling behavior is tough to measure and assess because of possible incoherency between response to questions on a scale and actual observed behavior. In the present study recycling is considered as the individual ability to effectively dispose different potential wastes. Recycling also requires a set of abilities. First students must know both recyclable materials and nonrecyclable materials, identify the correct bin, and throw out the right bin. Therefore, it can be concluded that recycling behavior has informational and behavioral facets. Knowing what is recyclable or nonrecyclable is essential but not enough. Behavioral factors have crucial implications for recycling behavior. Perceived ability and perceived behavioral control over recycling are important to perform recycling behavior. However, perceived skill about recycling may differ from actual skill because humans are

inclined to overestimate their skills when they respond on a scale or test (Baxter & Norman, 2011; Passafaro & Livi, 2017; Sundström, 2011). When students take a test on recycling, they may tend to overestimate their skills related to recycling. As a result, it is difficult to measure recycling behavior due to the difference between actual skill and perceived skill. On the other hand, recycling behavior depends on contexts vary from one context to other context. For instance under teacher expectation and peer pressure, students may be inclined to perform recycling behavior in order to obey the rules in school context whereas they don't feel teacher and peer pressure in home settings and may not perform recycling behavior. However possession of recycling knowledge is associated with recycling behavior (Clay, 2005). It can be claimed that the more students have knowledge about what can be recycled and how to recycle, the more they are inclined to perform recycling behavior (Seacat & Northrup, 2010).

As a result of global awareness of necessity of recycling and beliefs that students can be taught how to recycle, schools have given remarkable importance to environmental education and learning outcomes related to recycling behavior and curricular aims have been placed into instructional curriculums from primary schools to high schools. Instructional curriculums around the world aim to foster pre-environmental beliefs, attitudes, and encourage students to act in accordance with pro-environmental behavior (De Young, 1990). On the other hand, it has been long known that environmental education produces positive results among primary school children (Asch & Shore, 1975). However, impact and achievement of instructional curriculums are dependent on contextual factors. Socioeconomic status (SES) is one of the contextual factors influencing academic achievement. Furthermore, it is known that academic achievement is closely correlated with SES (Lamdin, 1996; Sirin, 2005; Sutton & Soderstrom, 1999). SES is also associated with multiple systems such as neighborhood location. In other words, familial SES determining the location of the child's neighborhood and school district provides both home resources, and social capital that enable sharing societal norms and values (Sirin, 2005). Therefore, SES can be addressed as distal factor which have impact on child's procedural knowledge of recycling.

There is an ongoing debate among researchers what SES includes. However, definition of SES by Duncan, Featherman, and Duncan (1972) is widely accepted. Because definition of SES by Duncan et al. (1972) is a composite measure (Adler et al., 1994; Bradley & Corwyn, 2002; Brito & Noble, 2014; Farah, 2018; Hackman & Farah, 2009; Hackman, Gallop, Evans, & Farah, 2015; Sirin, 2005). Definition of SES by Duncan et al. (1972) consists of three indicators as parental income, parental education, and parental occupation. Parental income indicates social and economic

resources that children benefit from. More parental income provides economic and social opportunities for children. Parental education is another indicator of SES definition by Duncan et al. (1972). Parental education partially reveals household income and is the most fixed aspect of SES (Sirin, 2005). Parental education also influences parent-child interaction. From the birth, children observe their parents as models and are more inclined to behave as their parents so as to adjust. It can be said that there is substantial difference between behavioral patterns of parents with lower education level and that of parents with higher education level. For example, the more parents have high education level, the more they tend to interact with their children by sounding different words. Interaction through wide range of different spoken words makes children more competent in cognitive domain (Hart & Risley, 2003). The third indicator is parental occupation which discloses information about children's familial prestige under a culture (Sirin, 2005).

It is known that SES is correlated with academic achievement (McLoyd, 1998; Sirin, 2005). Knowledge about recycling is one of the academic subject delivered by schools. Therefore, theoretically it can be contemplated that SES characteristics of students may influence the interactions with their parents and SES is associated with recycling knowledge. As for recycling behavior, social backgrounds of family predict household recycling (Seacat & Boileau, 2018).

Rationale of the present study

The present study aims to reveal correlation between SES backgrounds of primary school children and procedural knowledge of recycling. As a pro-environmental behavior, recycling seems as a product which emerges through complex societal interactions. In the present study recycling behavior is seen as an individual behavioral skill to know which waste can be recyclable and where to dispose waste (Passafaro & Livi, 2017) because of the fact that procedural knowledge was intended to be examined in terms of primary school children's SES backgrounds as an outcome variable of the study. Procedural knowledge is stronger than declarative knowledge in prediction of recycling behavior (Kaiser & Fuhrer, 2003). Teaching recycling skill has become so crucial to sustain and preserve nature that education systems have included it into their instructional curriculum. However, instructions on recycling skill are open to be influenced from primary school children's SES backgrounds.

SES backgrounds have been agenda among educators so correlation with SES and academic achievement has been sought. Lower SES led to lower proficiency phonological literacy and emergent literacy (Henning,

McIntosh, Arnott, & Dodd, 2009; McDowell, Lonigan, & Goldstein, 2007). Fuligni (1997) found out that there is a moderate association between academic achievement in mathematics and English, and adolescents' SES backgrounds. Similarly, White (1982) observed that there is a medium correlation between academic achievement and SES background of students. Caro, McDonald, and Willms (2009) concluded that academic achievement in mathematics varies according to SES background of primary school children in Canada. Hackman and Farah (2009), Hair, Hanson, Wolfe, and Pollak (2015) reported that SES is very important predictor cognitive performance and development of children. Lam (2014) concluded that poverty made primary school children more vulnerable to lower achievement due to lack of cognitive stimulation. Influence of SES is not restricted to cognitive domain but also it is correlated with affective domain. Piotrowska, Stride, Croft, and Rowe (2015) found that lower SES resulted in antisocial behavior. Tippett and Wolke (2014) reached the conclusion that lower SES is moderately correlated with bullying. Bøe, Sivertsen, Heiervang, Goodman, Lundervold, and Hysing (2014) identified that mental health of children studying 5th and 7th grades is correlated with their SES backgrounds. Dodge, Pettit, and Bates (1994) noted that SES is closely correlated with socialization problems and externalizing behavior problems among kindergarten and primary school children.

Correlation between SES and recycling behavior was addressed among adults in the relevant literature. Everett and Peirce (1992) concluded that the more education level and household income increase, the more adults tend to recycle. Berger (1997) reported that education level, household income, residential area, dwelling type are important determinants of recycling behavior among Canadian adults. Owens, Dickerson, and Macintosh (2000) found that household income is closely linked to recycling efficiency. In the context of SES and recycling behavior it is known that social background of families is associated with recycling behavior as an environmental behavior (Chan, 1996; Seacat & Boileau, 2018). On the other hand, public education campaigns on recycling produced desired results (Do Valle, Reis, Reis, Menezes, & Rebelo, 2004; Schultz, Oskamp, & Mainieri, 1995; Vining & Ebreo, 1989, 1990).

Instructional programs that aims to foster pro-environmental behaviors including recycling behavior have been designated around the world and achieved to foster recycling behavior (Hamad, Cooper, & Semb, 1977; Hofverberg & Maivorsdotter, 2018; Ibánez & Wang, 2015; Jaus, 1984; Smith, Rechenberg, Cruey, Magness & Sandman, 1997; Treagust, Amarant, Chandrasegaran, & Won, 2016).

In the relevant literature, there is a gap on SES background of primary school children and recycling behavior in the context of procedural

knowledge. In the present study, it is inquired if SES backgrounds of primary school children predict procedural knowledge of recycling.

Method

Design of the study

In epistemological sense, it was assumed that social reality is independent from the mind and can be reached. Quantification and prediction of human behavior in terms of variables and are main features of the present study. Therefore, quantitative research tradition was employed. Moreover, it was sought to reveal such a relation between SES background of primary school children and their procedural knowledge of recycling that the present study was designed in correlational research (Cohen, Manion, & Morrison, 2007).

Sampling

Due to financial and time constraints sampling strategies were used. Impossibility of listing all primary school children and random inclusion into sample, and voluntary participation of primary school children convenience sampling was used (Fraenkel, Wallen, & Hyun, 2012). Financial, travel, distance, and time constraints made nationwide access to primary schools difficult. Therefore, the present study was carried out in Hatay which is in south of Turkey. As a result of the convenience sampling, 155 primary school children studying 1st, 2nd, 3rd, and 4th grade participated in the present study. Eighty-six of them were female primary school children while 71 of them were male primary school children.

Measure

Recycling assessment instrument (RAI)

Procedural knowledge on recycling was measured through Recycling Assessment Instrument (RAI) developed by Coskun, Topkaya, Coskun, and Kara (2018). The RAI is objective standardized test which was developed for primary school children to assess procedural knowledge on recycling. RAI's Cronbach α internal consistency coefficient is 0.83 and its reliability based on split–half measures varies between 0.72 and 0.77. Therefore, RAI can generate valid and reliable results in measuring procedural knowledge of recycling. On the other hand, RAI assess procedural knowledge of recycling through drawings of recyclable and nonrecyclable materials. RAI consists of 13 items. Each of the items has three response options as thrash-bin, recycle-bin, and garden. For nonrecyclable materials response of

garden was given 1 point, waste-bin was coded as 2 points and thrash-bin was given 3 points. For recyclable materials response of garden was given 1 point, thrash-bin was given 2 points, and recycle-bin was coded as 3 points. As a result, highest point of the RAI is 39 points while the lowest point is 13 points.

SES measurement

SES backgrounds of the participant primary school children were determined by the definition by Duncan et al. (1972). In this definition parent education and parental occupation was accepted as familial SES background of the participant primary school children. On the other hand, residential area was accepted another variable and included in the data collection. Measurement of parental education was conducted separately for mothers and fathers. Parental education level was graded as illiterate, primary school, secondary school, high school, university, and postgraduate. Parental occupation was measured through the model by Stevens and Featherman (1981). Data related to parental occupation were coded as sales, professional, laborer, clerical, managerial, crafts, transport, operatives, and unemployed. Professional, sales, and managerial are prestigious occupation while laborer, operatives, and transport are unprivileged occupation. In addition, residence type was arranged as rural area and urban area.

Data collection procedures

In ontological sense it was assumed that recycling behavior, social reality being investigated, is external and independent from the researcher's and the participants' minds, and objective. In epistemological sense it was assumed that knowledge related to recycling can be acquired through objective and external observation (Burrell & Morgan, 1979). The researchers adopted external observer role due to ontological and epistemological assumptions. Consequently, The researchers followed same steps during data collection: giving away the RAI to the participant children, collecting their responses to the items on the RAI, and scaling their responses.

Before the study was launched, official necessary permissions from the local education authorities was taken. Due to financial, travel, distance, and time constraints, the study was decided to be conducted in Hatay city in Turkey. The schools where the participant children study were visited. Purpose of the research was explained to primary school children and their teachers. One hundred fifty-six primary school children and their teachers accepted to participate voluntarily in the study. After the primary school teachers ensured that they taught curricular objects of the National Primary

Curriculum related to recycling and did not conduct extra-curricular activities on recycling, the RAI forms were given to the participant primary school children. The extra-curricular activity on recycling was a disrupting variable that could influence the study. They were asked to imagine that they resided in a house which was close to a road and there were two bins as recycle bin and thrash bin before they began to respond. They were also told them to think that they had used the materials depicted in the RAI and wanted to threw out. Then the researchers demanded them to respond where to put. As a result, they responded to the items by marking the option. Moreover, the items were together one by one in order to make testing procedures standardized.

Data analysis

SES backgrounds are nominal variable and score from the RAI are continuous variable so Spearman-Brown correlation was employed to reveal the correlation between SES backgrounds of the participant children and procedural knowledge of recycling. Regression analysis was used to build a model based on the correlation between SES backgrounds of primary school children and procedural knowledge on recycling (Field, 2009).

Results

Descriptive statistics results about demographic characteristics of the participant children were shown in Table 1.

Table 1. Demographic characteristics of the participant primary school children and their descriptive statistics.

Variable		*N*	*f* (%)	*M*	*SD*
Maternal education (ME)	Illiterate	20	12.8	26.60	3.19
	Primary School	37	23.7	26.86	2.47
	Secondary School	37	23.7	29.27	3.07
	High School	27	17.3	31.14	3.23
	University	35	24.4	34.25	2.10
Paternal education (PE)	Illiterate	8	5.1	28.37	1.59
	Primary School	50	32.1	29.92	5.09
	Secondary School	40	25.6	27.72	2.66
	High School	41	26.3	30.80	3.46
	University	17	10.9	32.61	1.41
Maternal profession (MP)	Unemployed	77	49.4	26.89	2.57
	Laborer	35	22.4	34.25	2.10
	Clerical	17	10.9	31.70	2.05
	Sales	27	17.3	31.14	3.23
Paternal profession (PP)	Unemployed	16	10.3	25.75	3.08
	Laborer	35	22.4	34.25	2.10
	Clerical	61	39.1	27.86	3.10
	Sales	44	28.2	30.43	2.96

ME = maternal education; MP = maternal profession; PE = paternal education; PP = paternal profession; RA = residential area.

Table 2. Results of multicollinearity diagnostics.

Predictor variables	MTC	VIF
Maternal Education (ME)	0.17	5.84
Paternal Education (PE)	0.55	1.79
Maternal Profession (ME)	0.12	8.05
Paternal Profession (PE)	0.28	3.51
Residential Area (RA)	0.14	0.6.80

As a result of the descriptive analysis, it was observed that 20 of the participant children's mothers (12.8%) are illiterate, 37 of their mothers (23.7) graduated from primary school, 37 of their mothers (23.7) graduated from secondary school, 27 of their mothers (17.3%) were high-school graduate, and 35 of their mothers (24.4%) finished university. As for paternal education level, it was found that 8 of the participant children's fathers (5.1%) are illiterate, 50 of their fathers (32.1%) graduated from primary school, 40 of their fathers (25.6%) completed secondary school, 41 of their fathers (26.3%) finished high school, and 19 of their fathers (10.9%) hold a university degree. Results about maternal employment indicate that 77 of the participant children's mothers (49.4%) have no employment, 35 of their mothers (22.4%) work as laborer, 17 of their mothers (10.9) are employed as clerical, and 27 of their mothers (17.3%) work in professions related to sales. Descriptive analysis also revealed that 16 of the participant children's fathers (10.3%) are unemployed, 35 of their fathers (22.4%) work as laborer, 61 of their fathers (39.1%) are employed in clerical jobs, and 44 of their fathers (28.2%) work as positions related to sales.

Descriptive analysis of demographic characteristics of the participant children's parents indicated that level of maternal education and paternal education level have similar patterns whereas maternal profession is very different from paternal profession. The unemployment of the mothers is higher than that of the fathers.

Before multiple regression analysis, casewise diagnostics and multicollinearity diagnostics were conducted in order to detect whether there is any residual and predictor variables influence each other. Casewise diagnostics were carried out based on Mahalanobis Distance (MD) and Cook Distance (CD). Multicollinearity was diagnosed through Variance of Inflation Factor (VIF), and multicollinearity tolerance coefficient (MTC) (Table 2).

As a result of the multicollinearity diagnostics, it was observed that there is no predictor variable do not have strong linear relationships with each other. Because VIF value is less than 10.00 and MTC values of predictor variables do not exceed 1.00 (Bowerman & O'Connell, 1990; Field, 2009; Myers, 1990) (Table 3).

Casewise diagnostics through CD revealed that no value of CD is higher than 1.00. Moreover, casewise diagnostics through MD did not detect any value of MD which exceeds 10.00. Therefore, it was concluded that there is

Table 3. Results of residual diagnostics.

Diagnostic	Minimum	Maximum	Mean
CD	0.00	0.10	0.01
MD	1.44	7.06	4.96

Table 4. Correlation analysis results through Spearman-Brown rank order.

Variable	*N*	ME		MP		PE		PP		RA	
Total score from the RAI	156	*r* 0.71	*p* 0.00**	*r* 0.61	*p* 0.0**	*r* 0.23	*p* 0.04**	*r* 0.15	*p* 0.04**	*r* 0.75	*p* 0.00*

*$p < 0.05$.
ME = maternal education; MP = maternal profession; PE = paternal education; PP = Paternal Profession; RA = Residential Area.

Table 5. Multiple regression analysis.

Variables	Std. β	*t*	*p*	Adjusted R^2
ME	0.15	1.44	0.15	0.59
MP	0.41	3.66	0.00**	
RA	0.25	2.24	0.04*	

*$p < 0.05$.
**$p = 0.01$.
ME = maternal education; MP = maternal profession; PE = paternal education; PP = paternal profession; RA = residential area.

no residual which can influence the regression model (Bernett & Lewis, 1978; Cook & Weisberg, 1982).

Correlation coefficient ranges between –1 and +1. It also varies in size. Correlation coefficient between 0 and 30 (±) is evaluated as weak correlation. A correlation between higher value of 0.30 (±) and 0.50 (±) indicates a medium relation and higher value of 0.50 is known as strong correlation (Cohen, 1988). Table 4 indicates that procedural knowledge of recycling is statistically, significantly and strongly correlated with ME ($r = 0.71$; $p < 0.05$), RA ($r = 75$; $p < 0.05$), and MP ($r = 0.61$, $r = 0.05$). However, it was observed that there is a statistically medium correlation between procedural knowledge of recycling and PE ($r = 0.\ 23$, $r < 0.05$), procedural knowledge of recycling is weakly correlated with PP ($r = 0.15$, $p < 0.05$) (Cohen, 1988; Field, 2009). Along with correlation analysis results, PE and PP were excluded from regression analysis due to insufficient correlation with procedural knowledge of recycling, outcome variable of the study (Table 5).

Results in Table 3 reveals that regression model which was built upon the correlation between outcome variable and predictive variables fits strongly to the data ($R^2 = 0.59$). Results of regression also suggests that regression model consisting of ME, MP, and RA substantially explains procedural knowledge of recycling among primary school children because of *R* value of 0.59 (Cohen, 1988; Muijs, 2010). Moreover, it was observed that power of prediction for MP and RA is moderate just as power of prediction for ME is weak. Therefore, RA and ME can be viewed as moderator variable in the regression model.

Generally speaking, overall results of the study disclose that paternal SES characteristics are not associated with procedural knowledge of recycling while maternal SES characteristics and residential area are closely related to procedural knowledge of recycling. Based on the regression model it can be said that the more maternal education level and maternal profession change, the more procedural knowledge of recycling tends to increase. Furthermore, the children residing in urban area have better procedural knowledge of recycling.

Discussion

Results of the study revealed that procedural knowledge of recycling is associated with maternal SES characteristics and residential area rather than paternal characteristics of SES. The more maternal education level increases, the more primary school children's procedural knowledge of recycling tends to rise. On the other hand, it was found that maternal unemployment leads to decrease procedural knowledge of recycling among the participant primary school children. As for residential area, living in urban area causes procedural knowledge of recycling to increase or vice versa, residency in rural area results in decrease in procedural knowledge of recycling.

Maternal SES factors are more related to procedural knowledge of recycling than paternal SES factors. Therefore, it can be concluded that maternal SES characteristics predict better procedural knowledge of recycling than paternal SES factors do among primary school children. This result can be explained through mother-child interaction. Mother-child interaction contains very wide range of variables so it is associated with several demographic variables. (Bates, Maslin, & Frankel, 1985). Demographic characteristics of mother are influential in mother-child interaction. Higher education level makes mother more caring, responsive, and sensitive to their children's needs (Boyle et al., 2006; Johnston, Murray, Hinshaw, Pelham, & Hoza, 2002).

Maternal education can be described as the years which are spent in education by mothers (Harding, Morris, & Hughes, 2015). Maternal education is one of the most addressed parental SES factors which influences dyadic interactions with their children. Because mothers who have higher education level can arrange their resources and activities in home learning environment for their children (Duncan & Magnuson, 2003; Duncan & Brook-Gunn, 1997; Bornstein & Bradley, 2003). Moreover, mothers with higher education level also interact with their children in more cognitively challenging way (Dollaghan et al., 1999; Harding, 2015; Korat, 2009; Mueller & Parcel, 1981). Reardon (2011) reported that maternal education is strongly

correlated with children's academic achievement and performance. When procedural knowledge of recycling is viewed as academic performance subject, maternal education is a variable that leads to increase in procedural knowledge of recycling. However, based on the result of the present study, level of maternal education cannot be claimed as sole and primary cause of either increase or decrease in procedural knowledge of recycling among the primary school children. Because maternal education is just one of the components of vast array factors such as genetics, family background, intelligence, well-being, and social-emotional states (Harding et al., 2015).

Contribution of maternal education to procedural knowledge of recycling can explained through human, cultural, and social capital. Maternal education enables mothers to access human, cultural, and social capital and those capitals are employed to improve children's outcomes in cognitive and social domains by the mothers. Higher procedural knowledge of recycling as a result of higher maternal education can be outcome of cultural capitals provided by higher maternal education level. According to Bourdieu (1986) schools and other institutions are representations of dominant and privileged class. In addition to that, teachers and school principals adopt values of high-culture individuals who display certain language use and behavioral codes. As a result, cultural capital includes high-class preferences that are necessary for academic achievement (Harding et al., 2015). Maternal education makes transmission of cultural capital to children easy. Maternal education also increases frequency of exposure of mothers to high-culture activities (Lareau, 2011; Smith, 1995). Mothers with higher education can transmit cultural capital to their children by modeling and explicit teaching. Higher maternal education is closely related to high-culture preferences and children's exposure to high-culture activities such as theater, arts, nature camps, museum visits. Recycling can be considered as behavioral codes and adopted by teachers, school administrators, and high-culture. Maternal education can make transmission of recycling to children easy. This transmission, in turn, has made primary school children more competent and efficacious in the RAI score. On the other hand, strong correlation between procedural knowledge of recycling and maternal education can be explained through social learning theory developed by Bandura (1986). According to Bandura (1986), most of learnt behaviors are a result of observation of models around social environment. Higher education level increases possibility of possession of recycling knowledge among mothers and this possession may make mothers more inclined to perform recycling behavior. Therefore, mothers with higher educational model become a behavioral model for their children in terms of recycling behavior. Based on this explanation it can be argued that educating mothers fosters indirectly

recycling behavior on their children. Therefore, higher maternal education level implies fostering recycling behavior among their children as well as access to more cultural and social capital.

As result of the study, it was concluded that maternal employment is positively and strongly correlated with procedural knowledge of recycling, outcome variable of the present study. However, it is theoretically sensible to think that maternal employment can have negative influence on children due to loss in shared time (Belsky & Eggebeen, 1991; Blau & Grossberg, 1990; Han, Waldfogel, & Brooks-Gunn, 2001). Positive and strong correlation between maternal employment and procedural knowledge of recycling contrasts with this explanation. Increase in procedural knowledge of recycling based on maternal employment can be dealt with quality of home learning environment. Maternal employment rises familial income. Familial income, in turn, results in better quality of home learning environment. Better quality of home learning environment offers wide range of instructional materials, toys, abundant books in home settings. Quality of home learning environment is linked to academic achievement (Blanden, & Gregg, 2004; Fergusson, Horwood, & Boden, 2008; Marks, Cresswell, & Ainley, 2006). When procedural knowledge is viewed as an academic subject, it can be claimed that maternal employment, one of the indicator of home learning environment quality, can lead to better procedural knowledge of recycling.

As a result of the study it was observed that paternal education and profession are less correlated with recycling behavior than maternal education and profession. Lower correlation of paternal demographic variables of the participant children with recycling behavior can be attributed to the fact that maternal interaction, attachment, involvement is more robust than that of fathers. Maternal influence of children's development is more influential than paternal influence (Grossmann et al., 2002; Moon & Hoffman, 2008). Because mothers feel themselves more responsible for children's development and are the first figure for children to trust, interact, and attach. On the other hand, it has been long known that maternal demographic factors are better predictors of children's academic achievement (Aram, 2010; Flouri & Buchanan, 2004; Stevenson & Baker, 1987). Similarly, maternal demographic factors are found to be better correlated with recycling behavior than that of paternal demographic factors. Consequently, it was concluded that the mothers with more prestigious profession and better education level convey more knowledge on recycling behavior or present better model in terms of recycling behavior than the fathers with equal prestigious profession and education level.

The present study includes key implications for policymakers and teachers. Based on the results, it can be concluded that supporting maternal SES

backgrounds of primary school children can generate more positive outcomes than supporting paternal SES backgrounds of them. Therefore, any investment in maternal SES backgrounds of primary school children can lead to better possession of procedural knowledge. On the other hand, curricular activities about procedural knowledge of recycling might yield less desired instructional outcomes on lower maternal SES primary school children who are likely to possess less procedural knowledge of recycling. Therefore, primary school children with lower maternal SES backgrounds should be supported through more extracurricular activities on procedural knowledge of recycling.

Results of the study indicated that there is a positive and strong relationship between residential area and procedural knowledge of recycling. Moreover, residential area predicts procedural knowledge of recycling among primary school children. In other words, primary school children residing in urban area scored higher that primary school children living in rural area. Based on this result, residency in urban are makes remarkable contributions to performance on the RAI measuring procedural knowledge of recycling. Municipalities initiate and conduct recycling campaign and encourage households to recycle. In addition to that recycling bins, advertisements of recycling on billboards are ubiquitous in urban area while there are very few initiations and campaigns on recycling in rural area. As a result, primary school children residing in urban area are more exposed to stimulus related to recycling behavior and can gain knowledge about recycling in informal ways.

Conclusion

The present study revealed that procedural knowledge is more related to maternal SES characteristics and residential area rather than paternal SES characteristics. High and positive correlation between maternal SES characteristics and procedural knowledge of recycling among primary school children can be ascribed to social capital and behavioral model provide by mothers as result of higher education level and maternal employment. It was also found that residential is associated with procedural knowledge of recycling. Residency in urban area can foster knowledge about recycling through initiations and campaigns of recycling conducted by municipalities.

Limitations of the study

The present study was designed and conducted through such a correlational research that establishing cause-outcome chain is beyond purpose of the study. Therefore, special curricular or extracurricular activities can

be developed and their impact can be tested on primary school children in comparison with SES. In addition to that, recycling behavior is influenced from culture (Crociata, Agovino, & Sacco, 2015). The present study was carried out in Turkish culture and results might be solely confined to Turkish culture. A cross-cultural research can be designed to reveal whether the correlational pattern between procedural knowledge of primary school children and their SES backgrounds, residential area is similar in different cultural contexts.

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